

ABSTRACT OF THE DISCLOSURE

The present invention relates to the induction, stabilization, and control of apomixis (asexual seed formation) in angiosperms for the purpose of producing, improving, and economically using superior-yielding agamic crops (crops possessing a capacity for both sexual and apomictic seed production). "Stabilizing" apomixis refers to processes that either convert a facultative apomict to obligate apomixis or confer mechanisms to a facultative apomict that prevent, during facultative sexual seed formation, the recombination of genes that cause apomixis such that progeny produced sexually from said facultative apomict inherit the allelic combinations required for apomixis. More specifically the present invention relates to (i) the production of two or more sets of genetically divergent sexual lines, either inbred or outcrossed, which sets of parental lines remain homozygous for genes that cause apomixis when hybrids are produced by crossing a member of one of such sets of lines with a member of another set, (ii) the hybridization of sexual inbred or outcrossed parental lines to produce apomicts, (iii) the stabilization of such apomicts through cytogenetic or molecular modifications, (iv) the improvement of apomicts by breeding or genetically engineering parental lines or apomicts, (v) the modification of facultative apomicts to abort female meiosis resulting in obligate apomixis except when a recombinant DNA that aborts meiosis is inhibited, and (vi) the modification of facultative apomicts to remain facultative except during inducible expression of a recombinant DNA that causes obligate apomixis by aborting meiosis. The various facets of this biological operating system may be selectively combined for the efficient production, improvement, and use of agamic crops.